

Features

- Low Series Resistance
- Low Capacitance
- High Cutoff Frequency
- Silicon Nitride Passivation
- Polyimide Scratch Protection
- Designed for Easy Circuit Insertion

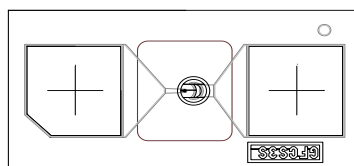
Description

M/A-COM's MA4E1310 is a gallium arsenide flip chip Schottky barrier diode. This diode is fabricated on a OMCVD epitaxial wafer using a process designed for high device uniformity and extremely low parasitics. This device is fully passivated with silicon nitride and has an additional layer of polyimide for scratch protection. The protective coatings prevent damage to the junction during automated or manual handling. The flip chip configuration is suitable for pick and place insertion.

Applications

The high cutoff frequency of this diode allows use through millimeter wave frequencies. Typical applications include single and double balanced mixers in PCN transceivers and radios, police radar detectors, automotive radar detectors, etc. This device can be used through 110 GHz.

Case Style ODS-1278



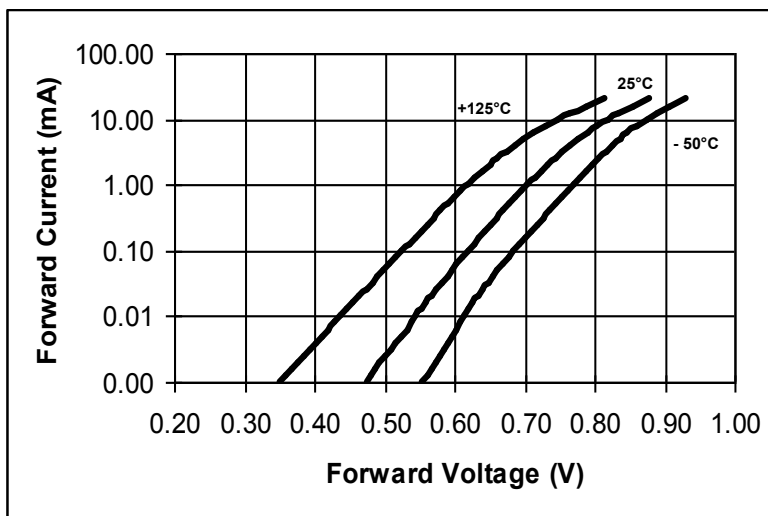
Electrical Specifications @ + 25 °C

Parameters and Test Conditions	Symbol	Units	MA4E1310		
			Min.	Typ.	Max.
Junction Capacitance at 0V at 1 MHz	Cj	pF		.010	
Total Capacitance at 0V at 1 MHz ¹	Ct	pF	.025	.040	.045
Slope Resistance ²	Rd	Ohms		7	9
Forward Voltage at 1mA	Vf1	Volts	.60	.70	.80
Reverse Breakdown Voltage at @ 10uA	Vbr	Volts	4.5	7	
SSB Noise Figure (Estimated)	NF	dB		6.5	

Notes:

1. Total capacitance is equivalent to the sum of junction capacitance Cj and parasitic capacitance Cp.
2. Slope Resistance = $(Vf1 - Vf2) / (10.5mA - 9.5mA)$

Forward Current vs Temperature



Absolute Maximum Ratings ¹

Parameter	Absolute Maximum
Operating Temperature	-65 °C to +125 °C
Storage Temperature	-65 °C to +150 °C
Incident LO Power	+20 dBm
Incident RF Power	+20 dBm .
Mounting Temperature	+235°C for 10 seconds
Electrostatic Discharge (ESD) Classification ²	Class 0

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Human Body Model

Handling Procedures

The following precautions should be observed to avoid damaging these chips:

- Cleanliness:** The chips should be handled in a clean environment. Do not attempt to clean die after installation.
- Static Sensitivity:** Schottky barrier diodes are ESD sensitive and can be damaged by static electricity. Proper ESD techniques should be used when handling these devices.
- General Handling:** The protective polymer coating on the active areas of these die provides scratch protection, particularly for the metal air bridge which contacts the anode. Die can be handled with tweezers or vacuum pickups and are suitable for use with automatic pick-and-place equipment.

Mounting Techniques

This device is designed to be inserted onto hard or soft substrates with the junction side down. It can be mounted with conductive epoxy or with a low temperature solder preform.

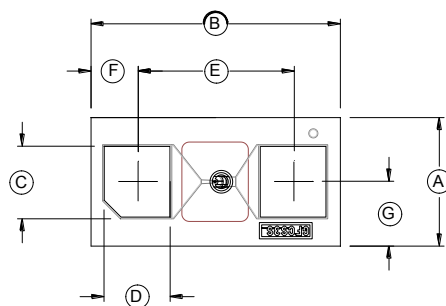
Solder Die Attach:

Solder which does not scavenge gold, such as Indalloy # 2, is recommended. Sn-Pb based solders are not recommended due to solder embrittlement. Do not expose die to a temperature greater than 235°C, or greater than 200°C for longer than 10 seconds. No more than three seconds of scrubbing should be required for attachment.

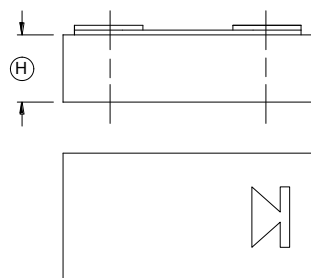
Epoxy Die Attach:

Assembly can be preheated to 125 - 150°C. Use a minimum amount of epoxy. Cure epoxy as per manufacturer's schedule. For extended cure times, temperatures should be kept below 200°C.

Flip Chip Outline Drawing



MA4E1310
Case Style 1278



DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.013	0.014	0.330	0.335
B	0.026	0.027	0.660	0.685
C	0.008	0.009	0.203	0.228
D	0.007	0.008	0.177	0.203
E	0.016	0.017	0.406	0.430
F	0.004	0.006	0.101	0.152
G	0.006	0.007	0.152	0.177
H	0.0075	0.0085	0.190	0.216

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.